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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/554,907	07/11/2000	MATS LEIJON	705/72450-2	6641

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EXAMINER	
MULLINS, BURTON S	

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 04/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/554,907	LEIJON, MATS	
	Examiner	Art Unit	
	Burton S. Mullins	2834	

-- The MAILING DATE of this communicati n appears on the c ver sheet with the correspondence address --

Peri d f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 May 2002*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 May 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Suspension

1. Pursuant to the Board of Appeal's final decision regarding U.S. Application No. 08/973,019, suspension has been lifted. As set forth in the decision on petition requesting suspension, the instant application was granted a suspension pending the decision on appeal of the '019 application. On November 27, 2002, the Board affirmed the rejection of the '019 application and on August 27, 2003, the Board denied applicant's request for reconsideration, thus terminating prosecution of the '019 application. An action on the merits follows.

Drawings

2. The drawings were received on May 29, 2002. These drawings are acceptable.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-4, 8-11, 13-17, 20-24, 29-32 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enoksen (US 4,041,431) in view of Elton et al. (US 5,036,165). Enoksen discloses an electromagnetic device (figure 1) comprising at least one magnetic circuit (31A) and at Ieast one electric circuit comprising at least one winding (40), the magnetic (31A) and electric circuits being inductively connected to each other and the device comprising a control arrangement (22) to control operation of the device, wherein the control arrangement (22) is adapted to control frequency, amplitude and/or phase as concerns electric power

to/from the device by the control arrangement (22) comprising means (22) for controlling the magnetic flux in the magnetic circuit (31A). Enoksen discloses that the control means (22) comprises at least one control winding (22) inductively connected to the magnetic circuit (31A). Enoksen discloses that the control arrangement (22) is adapted to control the reluctance in the magnetic circuit (column 6, lines 61-64). Enoksen discloses that the control winding (22) and the winding (40) of the electric circuit are arranged to be passed by substantially the same magnetic flux (31A). Enoksen discloses that the control arrangement (22) is adapted to add a magnetic flux addition to the magnetic flux in the magnetic circuit (figure 1). Enoksen discloses that the winding is wound about a magnetic core (12). Enoksen discloses that the electric circuit comprises at least two windings (40) coupled in series, that the magnetic circuit (31A) comprises at least two alternative flux paths, that the at least one control winding (22) is adapted to control the magnetic flux (31A) to pass in any of or both of these flux paths and that the two windings (40) of the electric circuit are located such that one of them is capable of being switched off from magnetic flux by means of the at least one control winding (22). Enoksen discloses that the magnetic circuit (31A) belongs to a transformer having primary and secondary windings (16,18) and that the primary and secondary windings (16,18) and the control winding (22) are arranged to be passed by the same magnetic flux (31A).

Enoksen discloses that the secondary winding (16) of the transformer comprises at least two winding pads (16, 40) coupled in series, that the magnetic circuit (31A) comprises at least two alternative flux paths, that at least two occurring control windings (22) are adapted to control the magnetic flux (31A) to pass in one or both of these paths and that the two winding parts (16,40) of the secondary winding (16) are placed such that one of them is capable of

being switched off from magnetic flux by means of the control windings (22). Enoksen discloses that the device comprises a magnetic core (12) having at least three legs (15,17,19,20) coupled in parallel and that two of these legs (19,20) belong to different flux paths whereas the third (15) is common to the two flux paths.

However, Enoksen does not disclose that the at least one winding or at least a part thereof comprises at least one electric conductor having an insulation system comprising an electric insulation formed by a solid insulation material and interiorly thereof an inner layer the at least one electric conductor is arranged interiorly of the inner layer and that the inner layer has an electrical conductivity which is lower than the conductivity of the electric conductor but sufficient to cause the inner layer to operate for equalization as concerns the electrical field exteriorly of the inner layer; or that the insulation system exteriorly of the insulation comprises an outer layer which has an electrical conductivity which is higher than that of the insulation to make the outer layer capable, by connection to each or otherwise a relatively low potential, of operating to equalize potential; or that the outer layer is arranged to substantially enclose the electric field, arising as a consequence of the electrical conductor, inwardly of the outer layer: or that the inner and/or outer layer comprises a semiconducting material; or that the conductor and its insulation system constitutes a winding formed by means of a flexible cable; or that the inner layer is in electric contact with the at least one electric conductor; or that the at least one electric conductor comprises a number of strands and that at least one strand of the electric conductor is at least in pad uninsulated and arranged in electric contact with the internal layer.

Elton discloses that the at least one winding or at least a part thereof comprises at least one electric conductor (102) having an insulation system comprising an electric insulation

formed by a solid insulation material (106) and interiorly thereof an inner layer (104) the at least one electric conductor (102) is arranged interiorly of the inner layer (104) and that the inner layer (104) has an electrical conductivity which is lower than the conductivity of the electric conductor (102) but sufficient to cause the inner layer (104) to operate for equalization as concerns the electrical field exteriorly of the inner layer (104). Elton discloses that the insulation system exteriorly of the insulation comprises an outer layer (110) which has an electrical conductivity which is higher than that of the insulation (106) to make the outer layer (110) capable, by connection to earth (1 14) or otherwise a relatively low potential, of operating to equalize potential. Elton discloses that the outer layer (110) is arranged to substantially enclose the electric field, arising as a consequence of the electrical conductor (102), inwardly of the outer layer (110). Elton discloses that the inner (104) and/or outer layer (110) comprises a semiconducting material. Elton discloses that the conductor (102) and its insulation system constitutes a winding formed by means of a flexible cable (100). Elton discloses that the inner layer (104) is in electric contact with the at least one electric conductor (102). Elton discloses that the at least one electric conductor (102) comprises a number of strands and that at least one strand of the electric conductor (102) is at least in part uninsulated and arranged in electric contact with the internal layer (104). The invention of Elton et al. has the purpose of avoiding the development of a corona discharge when an electrical potential exists between the conductor and the region adjacent the exterior surface of the insulator.

It would have been obvious at the time the invention was made to modify the electromagnetic device of Enoksen and provide it with the cable disclosed by Elton et al. for

the purpose of avoiding the development of a corona discharge when an electrical potential exists between the conductor and the region adjacent the exterior surface of the insulator.

Further, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the insulation resistivity according to the environment since it has been held that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose polymeric materials for the insulation since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

5. Claims 5-6, 12 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enoksen in view of Elton et al. as applied to claim 1 above, and further in view of Olsson (US 5,084,663). Enoksen and Elton disclose an electromagnetic device as described in item 1 above. However, neither Enoksen nor Elton disclose material having a permeability greater than 1 is included in the magnetic circuit and that the control arrangement is adapted to control the reluctance in the magnetic circuit by varying the permeability of one or more such zones of the magnetic circuit which have variable permeability; or that the zone or zones have a variable permeability comprise one or more gaps in the magnetic circuit; or that the magnetic circuit is arranged in the stator or rotor of a rotating electric machine; or that the magnetic circuit comprises one or more magnetic cores having slots for the winding; or that the device is

constituted of a generator, motor or synchronous compensator. Olsson discloses material (air) having a permeability greater than 1 is included in the magnetic circuit and that the control arrangement is adapted to control the reluctance in the magnetic circuit by varying the permeability of one or more such zones (16a,16b) of the magnetic circuit which have variable permeability.

Olsson discloses that the zone or zones having a variable permeability comprise one or more gaps in the magnetic circuit (figure 1). Olsson discloses that the magnetic circuit is arranged in the stator or rotor (15) of a rotating electric machine. Olsson discloses that the magnetic circuit comprises one or more magnetic cores having slots for the winding (13,14). Olsson discloses that the device is constituted of a generator, motor or synchronous compensator. Olsson's invention has the purpose of activating the stator winding before the position sensor indicates the alignment of the stator with the rotor.

It would have been obvious at the time the invention was made to modify the electromagnetic device of Enoksen and Elton and provide it with the zones of variable permeability disclosed by Olsson for the purpose of activating the stator winding before the position sensor indicates the alignment of the stator with the rotor.

6. Claims 7, 12 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enoksen in view of Elton as applied to claim 1 above, and further in view of Flick (US 4,164,672). Enoksen and Elton disclose an electromagnetic device as described on item 1 above. However, neither Enoksen nor Elton disclose that the magnetic circuit is without magnetic core. Neither Enoksen nor Elton disclose that the device is directly connected to a power network for high voltage, suitably 36 kv and more, without intermediate transformer.

Flick discloses that the magnetic circuit is without magnetic core. Flick discloses that the device is directly connected to a power network for high voltage, suitably 36 kv and more, without intermediate transformer (column 6,lines 51-55). Flick's invention has the purpose of creating a machine capable of being connected to a power network without a transformer. It would have been obvious at the time the invention was made to modify the electromagnetic device of Enoksen and Elton and provide it with the magnetic circuit and connection disclosed by Flick for the purpose of creating a machine capable of being connected to a power network without a transformer.

7. Claims 18-19 and 27-28 are rejected under 35 U.S.C. 1O3(a) as being unpatentable over Enoksen in view of Elton as applied to claim 1 above, and further in view of Penczynski et al. (US 3,959,549). Enoksen and Elton disclose an electromagnetic device as described on item 1 above. However, neither Enoksen nor Elton disclose that the inner layer, the outer layer and the solid insulation present substantially equal thermal properties; or that the solid insulation and the inner layer and/or the outer layer are formed by materials having substantially equal E-modulus; or that the inner layer and/or the outer layer and the solid insulation are formed by materials presenting substantially equal thermal coefficients of expansion.

Penczynski discloses that the inner layer, the outer layer and the solid insulation present substantially equal thermal properties. Penczynski discloses that the solid insulation and the inner layer and/or the outer layer are formed by materials having substantially equal E-modulus. Penczynski discloses that the inner layer and/or the outer layer and the solid insulation are formed by materials presenting substantially equal thermal coefficients of

expansion (column 4, lines 37-40). The invention of Penczynski has the purpose of improving the mechanical elasticity of the insulation.

It would have been obvious at the time the invention was made to modify the electromagnetic device of Enoksen and Elton and provide it with the thermal properties for insulation disclosed by Penczynski for the purpose of improving the mechanical elasticity of the insulation.

8. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enoksen in view of Elton as applied to claim 1 above, and further in view of Breitenbach et al. (US 4,785,138). Enoksen and Elton disclose an electromagnetic device as described on item 1 above. However, neither Enoksen nor Elton disclose that the inner layer and/or the outer layer and the solid insulation are rigidly connected to each other over substantially the entire interface to ensure adherence also on flexing and temperature change; or that the solid insulation and the inner layer and/or the outer layer are formed by materials having a high elasticity to maintain mutual adherence on strains during operation.

Breitenbach et al. disclose that the inner layer and/or the outer layer and the solid insulation are rigidly connected to each other over substantially the entire interface to ensure adherence also on flexing and temperature change. Breitenbach et al. disclose that the solid insulation and the inner layer and/or the outer layer are formed by materials having a high elasticity to maintain mutual adherence on strains during operation (column 4, lines 24 to 28). The invention of Breitenbach et al. has the purpose of minimizing thermal aging and avoiding detaching of the layer from the conductor due to bending or axial stress.

It would have been obvious at the time the invention was made to modify the electromagnetic device of Enoksen and Elton and provide it with the insulation strength disclosed by Breitenbach et al. for the purpose of minimizing thermal aging and avoiding detaching of the layer from the conductor due to bending or axial stress.

Response to Arguments

9. Applicant's arguments filed April 29, 2002 have been fully considered but they are not persuasive. Applicant argues that Elton's cable is a power transmission cable and not one employed in a transformer or dynamo-electric machine winding, that the cable is brittle and not bendable to any great extent, and that therefore Elton is not suitable for combination with Enoksen. With regard to applicant's assertion that Enoksen's transformer operates outside the range of applicant's invention, it is noted that there is nothing in the claim language which limits, either explicitly or implicitly, the range of operational voltages or currents. With regard to applicant's assertion that Elton's cable would not be suitable as a winding in an electric machine, the examiner points out that Elton clearly intends the insulated conductors for use as windings in an electrical machine, in particular in Elton US 4, 853,565 incorporated into the disclosure of Elton '165 by reference. See Elton '565 abstract, c.4, line 50-c.6, line 4; c.8, lines 45-60 and Figs.1-6. With regard to applicant's assertion that Elton's cable is not flexible and cannot be bent, the examiner notes that Elton's windings 50 "initially extend axially and then bend circumferentially so as to provide a connection between one bar and a second circumferentially disposed bar in the stator core" (Elton '565, c.5, line 66-c.6, line 1). The manner of bending is shown in Fig.5. Thus, adequate "flexibility" is provided by such a

bend. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Elton's cable winding minimizes the possibilities of corona discharge, maintains resistivity value after impregnation, minimizes voids and maintains uniform and equal electric potential (Elton '565, c.2, lines 44-60).

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 571-272-2029. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 571-272-2034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
April 15, 2004